
**Proposition 13 Grant Proposal for
Programs for the Installation of Pre-Rinse Spray Heads and
Water and Energy Efficient Dishwashers
for the Food Service Industry**

Submitted by
The East Bay Municipal Utility District



March 1, 2002

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**Consolidated Water Use Efficiency 2002 PSP
Proposal Part One:**

A. Project Information Form

1. Applying for (select one): ☒ (a) Prop 13 Urban Water Conservation Capital Outlay Grant
☐ (b) Prop 13 Agricultural Water Conservation Capital Outlay Feasibility Study Grant
☐ (c) DWR Water Use Efficiency Project
2. Principal applicant (Organization or affiliation): East Bay Municipal Utility District
3. Project Title: Pre-Rinse Spray Head and Dishwasher Installation Program for Food Service Industry
4. Person authorized to sign and submit proposal:
- | | |
|-----------------|---|
| Name, title | <u>Dennis M. Diemer</u>
<u>General Manager</u> |
| Mailing address | <u>P.O. Box 24055, Oakland, CA</u>
<u>94623-1055</u> |
| Telephone | <u>(510) 287-0101</u> |
| Fax. | <u>(510) 287-0188</u> |
| E-mail | <u></u> |
5. Contact person (if different):
- | | |
|------------------|--|
| Name, title. | <u>Joseph Lerma, Water</u>
<u>Conservation Representative</u> |
| Mailing address. | <u>P.O. Box 24055, MS #48,</u>
<u>Oakland, CA 94623-1055</u> |
| Telephone | <u>(510) 986-7611</u> |
| Fax. | <u>(510) 287-1883</u> |
| E-mail | <u>jlerma@ebmud.com</u> |
6. Funds requested (dollar amount): \$964,163

7. Applicant funds pledged (dollar amount):	<u>\$500,000</u>
8. Total project costs (dollar amount):	<u>\$1,464,165</u>
9. Estimated total quantifiable project benefits (dollar amount):	<u>\$5,160,000</u>
Percentage of benefit to be accrued by applicant:	<u>100%</u>
Percentage of benefit to be accrued by CALFED or others:	<u>85%</u>

**Consolidated Water Use Efficiency 2002 PSP
Proposal Part One:**

A. Project Information Form (continued)

10. Estimated annual amount of water to be saved (acre-feet):	<u>2400</u>
Estimated total amount of water to be saved (acre-feet):	<u>12,000</u>
Over ____ years	<u>5</u>
Estimated benefits to be realized in terms of water quality, instream flow, other:	<u>Not qualified - increased stream flow in Delta, improved water quality</u>
11. Duration of project (month/year to month/year):	<u>Oct. 2002 - Oct. 2004</u>
12. State Assembly District where the project is to be conducted:	<u>11,14,15,16,18</u>
13. State Senate District where the project is to be conducted:	<u>7,9,10</u>
14. Congressional district(s) where the project is to be conducted:	<u>7,9,10</u>
15. County where the project is to be conducted:	<u>Alameda & Contra Costa</u>

16. Date most recent Urban Water Management Plan submitted to 2000
the Department of Water Resources:

17. Type of applicant (select one): ☐ (a) city _____
Prop 13 Urban Grants and Prop 13 ☐ (b) county
Agricultural Feasibility Study Grants: ☐ (c) city and county
☐ (d) joint power authority
☒ (e) other political subdivision of the State,
including public water district
☐ (f) incorporated mutual water company

DWR WUE Projects: the above entities ☐ (g) investor-owned utility
(a) through (f) or: ☐ (h) non-profit organization
☐ (i) tribe
☐ (j) university
☐ (k) state agency
☐ (l) federal agency

18. Project focus: ☐ (a) agricultural
☒ (b) urban

**Consolidated Water Use Efficiency 2002 PSP
Proposal Part One
B. Signature Page**

By signing below, the official declares the following:

The truthfulness of all representations in the proposal;

The individual signing the form is authorized to submit the proposal on behalf of the applicant; and

The individual signing the form read and understood the conflict of interest and confidentiality section and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant.

Signature

Name and title

Date

Project Summary

This project involves the installation of two water and energy saving devices in the food industry, 6,541 pre-rinse spray nozzles and 100 dishwashers, in a co-operative statewide effort and administered by the East Bay Municipal Utility District (EBMUD).

EBMUD is submitting this proposal in cooperation with the San Diego County Water Authority, City of San Jose, Santa Clara Valley Water District, San Francisco PUC. Technical support and program assistance will be provided by the PG&E Food Service Technology Center (FSTC). A summary of this proposal is presented below

Project Goals

Install 6,541 pre-rinse spray nozzles and 100 dishwashers in food service industry over a 2-year period and evaluate water and energy savings.

Water Savings:	▪ 2.14 MGD (2,400 AFY)
Energy Savings:	▪ 3.0 million therms annually
Program Cost:	▪ \$1,464,165
Program Benefits:	▪ 5,160,000
Net Present Value:	▪ \$3.55 million (assumes 5-year product life)
Applicant Funds:	▪ \$500,000
Requested Funds	▪ \$964,165
Lead Administrative Agent	▪ East Bay Municipal Utility District
Cooperative agencies:	▪ San Diego County Water Authority, Santa Clara Valley Water District, City of San Jose, San Francisco PUC
Technical Support:	▪ PG&E Food Service Technology Center
Marketing Plan:	▪ Direct Mail/Door-to-Door Canvassing

It is estimated that approximately 2,400 acre-feet of water will be saved annually by the end of the second year. The proposed program, besides having a net present value of approximately \$3.55 million, also has a community benefit of 3.0 million therms of conserved energy.

EBMUD and the participating agencies have extensive experience in project management and in the implementation of this program will have the support of the PG&E FSTC. The project team is prepared to initiate this program immediately after the execution of an agreement.

A. Scope of Work: Relevance and Importance

The efficient use of California's limited water resources is a critical local, regional and statewide issue. This project has the potential to positively impact the Bay-Delta system by reducing the overall reliance on Bay-Delta and tributary system water exports and supports long-term improvements to Bay Delta system water management. Water conservation efforts employed by EBMUD and participating agencies are important components toward long-term, integrated resources planning, and represent a comprehensive effort to reliably meet the water needs of wholesale and retail customers while reducing pressure placed on the Bay-Delta system to meet regional and statewide water needs.

One of the fundamental objectives of the CALFED Bay-Delta Program is to reduce the disparity between Bay-Delta water supplies and current and projected beneficial uses dependent on the Bay-Delta system. Water use efficiency projects are one of the cornerstone strategies the CALFED Bay-Delta program is deploying to achieve this objective. The unpredictable state water supply and increasing demand on the state's water resources have resulted in a coordinated effort by the California Department of Water Resources, water utilities, environmental organizations, and other interest groups to work toward developing urban water conservation best management practices. This consensus-building effort resulted in the establishment of the California Urban Water Conservation Council and a Memorandum of Understanding Regarding Urban Water Conservation in California.

This program will provide water and energy savings and valuable information to enable the participating agencies, other urban water suppliers, and consumers to efficiently evaluate and implement strategies and technologies that conserve potable water through cost-effective on-site conservation. The program also will promote public awareness and acceptance of creative water use efficiency practices.

B. Scope of Work: Technical, Work Plan, Monitoring and Assessment

This proposal involves the direct install of 6,541 pre-rinse nozzles and 100 water and energy efficient dishwashers, via a rebate, in the food service industry.

Water consumption within typical restaurants (excluding fast-food) is generally driven mostly by the dish room. The largest water users within this room are (1) the pre-rinse operation where dishes, glassware, and utensils are prepared for the dishwasher and (2) the dishwasher itself. These two operations generally consume around two-thirds of all water used in a restaurant.

Dishwashers are an integral part of most every food service operation where chinaware, glassware and non-disposable utensils are used. Hot water consumption has been a large factor in the operating cost of these machines. In recent years, the emphasis on reducing food service costs has led the manufacturers to develop energy-efficient machines for the sole purpose of reducing hot water consumption, thus reducing the size of a restaurant's water heater and the energy cost of operation. Yet, the resulting benefits in the area of water consumption are significant as well. These new efficient machines are capable of washing a standard rack¹ of dishes or glassware in only 1.2 gallons of hot water, whereas earlier models used upwards of 2.5 gallons of hot water.

Number of Installations in California

Medium-volume restaurants and similar food service operations wash as many as 1,000 racks of dishes every week, or over 50,000 racks per year, while high-volume operations may wash over 100,000 racks per year. At the end of 1999, over 74,000 restaurants and bars were permitted in California.² A certain proportion of these businesses could be considered as establishments with medium to high rack throughput qualifying as candidates for replacement program involving efficient dishwashers. According to a 1995 study by representatives of the California Department of Water Resources, approximately 18 percent of these establishments are in the high-volume category, while an estimated 52 percent are medium-volume operations. Thus, about 70 percent (about 50,000 installations) fall into the medium and high categories, a undefined portion of which are still using water (and energy) inefficient dishwashers.

Rebuild vs. Replace

The useful life of a typical restaurant dishwasher exceeds 20 years, although it is the custom in the industry to rebuild these machines in order to extend their life well beyond the 20 years. Therefore, older inefficient dishwashers remain in place because the rebuilding is usually much less costly (in the short term) than replacement with a new efficient one. Financial incentives to replace inefficient commercial dishwashers could thus effect a change in this long-standing practice.

¹ A standard rack is 20 inches by 20 inches in size, roughly equal to the trays found in most residential dishwashers.

² State of California Board of Equalization; figure is for the 4th quarter of calendar year 1999.

Certification of Equipment

Commercial dishwashers are certified both as to meeting certain sanitary standards and to meeting electrical safety standards. In the former case, NSF International³ is the testing and certification entity while in the latter situation, Underwriters Laboratory tests and certifies the machines as to electrical safety against UL Standard 921. NSF International's testing work includes the measurement and publication of water consumption data on every machine that it certifies. However, reliable water consumption data for existing installed non-efficient machines is not currently available. Therefore, water savings determinations are not yet being based upon actual field data; this data must be gathered to develop a profile of expected water savings under various equipment replacement scenarios.

Dishwasher Program: Start-up, Organization, and Segmentation

Included within this task will be the establishment of a semi-formal arrangement with the Pacific Gas and Electric (PG&E) Food Service Technology Center for their concurrent technical support for the Program. The Center possesses extensive data and experience with commercial dishwashers covering both energy and water use.

Working closely with PG&E and the dishwasher manufacturers (and using standards information from NSF International and Underwriters Laboratories), establish a water use categorization (segmentation) of the various types and capacities of water-efficient dishwashing equipment currently available in the marketplace.

Pre-Rinse Program

Participating water utilities will be program implementers, going door-to-door explaining the Program and offering immediate installation of free pre-rinse spray valves. Participating water utilities know how to implement door-to-door conservation programs, install product, and manage inventory. The existing water utility infrastructure allows for rapid program deployment and drives down program costs.

The Spray Valve Installation Program overcomes a great number of traditional market barriers. The program design is simple and straightforward. The Spray Valve Program is a direct mail and door-to-door canvass program that provides restaurants, cafeterias, and other food preparation establishments with free product and free installation.

³ NSF International was founded in 1944 as the National Sanitation Foundation and is known for the development of standards, product testing and certification services in the areas of public health safety and protection of the environment. NSF's Standard 3 is the governing standard for "Commercial Spray-type Dishwashing and Glasswashing Machines."

The savings for this program are high. We know the pre-rinse spray valve savings are there; our job is to convince the food industry to embrace this new technology. There is no better way to show them how well the efficient spray valves work than to walk into a customer's dish room and install the product for them.

Pre-rinse spray valves are part of the dishwashing assembly and are used in the typical food service dish room to pre-clean the dishes prior to placement in the dishwasher. Almost every commercial kitchen in the country has one pre-rinse spray valve, and most facilities use two or three. A conservative estimate of the number of pre-rinse spray valves in California alone is 200,000.

Most high-flow spray valves use over 3.0 gallons per minute (gpm) of hot water and are used, on average, 6 hours per day. The flow rate of water- and energy-efficient models is only 1.6 gpm. These units can save the food service operator over 300 gallons of hot water per day, which equates to approximately \$500 per year in utility savings. The efficient models have an added benefit in that they are more effective in the cleaning of dishes due to the more intense spray; saving labor time in dishwashing. Note: Currently, there is no maximum flow rate established for these units and food service operators have the choice, when replacing a valve, between an inefficient and an efficient unit.

The removal of an existing high-volume, inefficient pre-rinse spray valve and replacement with an efficient unit is a simple task and normally involves less than 10 minutes of labor. The Program proposes to target approximately 50,000 local food service operations⁴ from which an estimated 16,900 spray valve replacements will be achieved⁵.

Replacement spray valves generally cost less than \$50 each and have a useful life of about five years. The maximum flow rate of the energy-efficient pre-rinse spray valve specified for this program will be less than 1.6 gpm and the cleaning performance of the valve will be equal to or better than the cleaning performance of a high-flow 2.65 to 4.0 gpm unit. The energy efficient valve's performance will be documented in a published test report and the information will be made available to the public. Only valves that meet the performance criteria developed by the Food Service Technology Center (FSTC) will be purchased for direct installation.

⁴ Local food service operations are considered those with 10 or fewer stores (including franchisees of the large chains). Many local operations are owner-operated and have not been targeted by previous regional or statewide energy- or water-efficiency programs. These types of local operations are generally considered "hard to reach" for the reasons listed under Market Barriers. Local food service operations also include stand-alone institutional and industrial organizations, including hospitals and other care facilities, cafeterias within industrial and institutional settings, and similar facilities.

⁵ Some food service establishments have more than one pre-rinse operation and, thus, more than one spray valve.

Market Barriers

An efficiency program, in order to be deemed a success, must meet or exceed a checklist of threshold performance requirements. This program meets or exceeds the following thresholds:

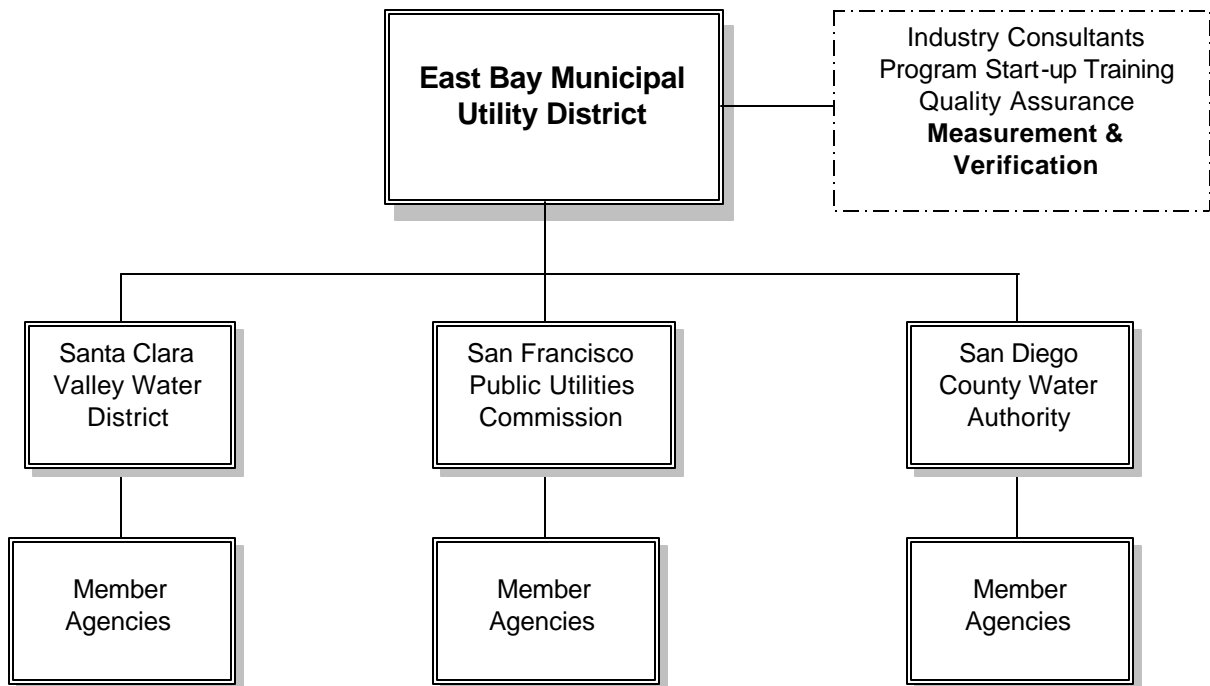
- **Long-Term Annual Energy (Gas and Electric) Savings** – The spray valves have a useful life of about five years and can result in either gas or electric savings, depending upon the source of the hot water. Test results have shown over 300 gallons of hot water and 2.0 therms saved per day for each efficient spray valve installed in a medium-sized food service facility.
- **Cost Effectiveness** - The savings from the retrofit are considerable. For customers, the payback will be immediate and the average customer will save \$500 on annual utility bills.
- **Addressing Market Failures or Barriers** - Both the building owner and the owner of the food service operation benefit from this Program design since the savings are reflected in both the energy and water billings. The marketing approach crosses multiple customer classes, economic conditions and ethnic groups. Since we arrive at the customer site and install the product immediately, the customer receives the highest level of customer service available. Customer convenience translates into high response rates.
- **Equity Considerations** - One of the appealing aspects of this program is that it will aid the small to mid-sized commercial customer; a group that is infrequently addressed and often is struggling financially. This program is offered to rural customers as well as urban businesses; and to small businesses as well as chain accounts, although it will be targeted at "hard-to-reach" customers.
- **Electric Peak Demand Savings** - The majority of the food service facilities operate during peak periods. Hot water savings for the electric customer equate to peak demand savings. Similarly, gas water heating customers will aid the natural gas industry providers in reducing their overall load as well.
- **Innovation** - Our Program design is based upon originality. The product is new to the market; our customer service level is first-rate, and the benefits accrue to multiple parties. Additionally, most other programs are passive in nature; a mailer is sent out and program staff waits for a customer response. This Program drives the response rate by face-to-face explanation to each eligible customer. Instead of the traditional 1-3% response rate, we expect to achieve a 31% response rate (the standard response rate for a door-to-door canvas program).

- **Synergies and Coordination with Programs Run by Other Entities** - This program is a win-win for a number of parties. Electric, gas, and water agencies utilities will work together to fund and operate the project. Furthermore, in most locations, this program will be integrated into existing water utility conservation programs, thereby enhancing customer exposure and optimizing Program costs.

In brief, EBMUD and participating water utilities strongly believe in the viability of the Pre-rinse Spray Valve Program for the Food Service Industry. The cost-effectiveness of this innovative product, the marketing outreach, and the variety of customer classes served bring benefits to all parties.

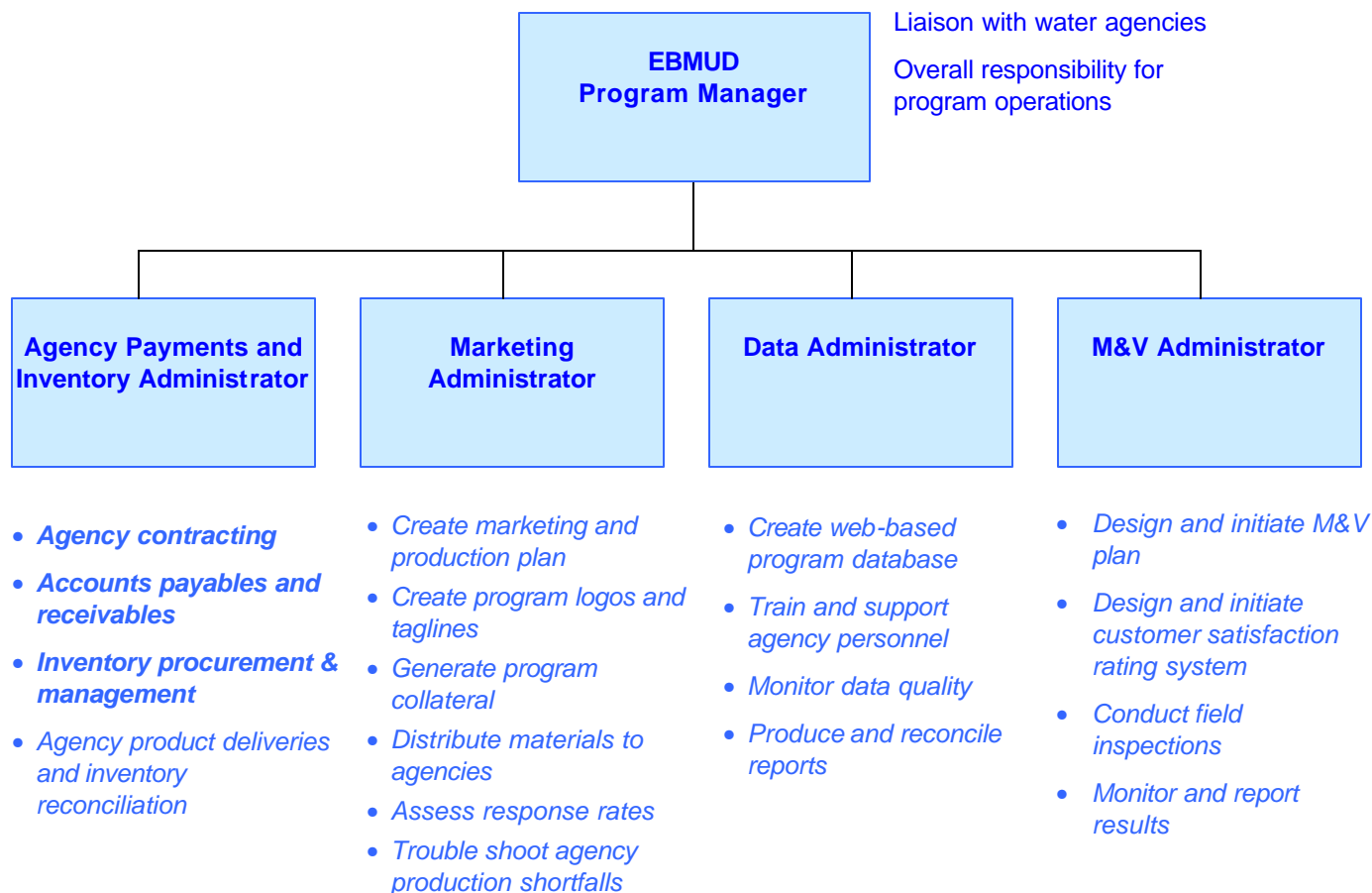
Program Process

The team for the Spray Valve Installation Program is shown below:



EBMUD will provide program administration with the additional advisory input of an industry steering committee. The local water utilities will perform the field operations including marketing outreach, door-to-door canvassing, and installation responsibilities. In order to ensure a smooth and efficient start-up, EBMUD and the water agencies utilities will contract with energy and water industry experts specifically experienced in this type of efficiency program.

Roles and Responsibilities



Below is the list of major roles and functions of each team member:

EBMUD	<ul style="list-style-type: none">▪ Program administration▪ Spray valve procurement and inventory management▪ Subcontractor/water utility contracting and payment▪ Program logo and collateral material development▪ Agency production planning and monitoring▪ Centralized data processing▪ Quality assurance▪ Measurement and verification
Participating Water Utility	<ul style="list-style-type: none">▪ Create target list of food service operations▪ Initiate direct mail marketing▪ Conduct door-to-door canvassing▪ Remove inefficient pre-rinse spray valves▪ Install energy-efficient pre-rinse spray valves▪ Collect Program data▪ Collect additional site data for future Program opportunities▪ Data entry of customer information▪ Submit reports and invoices to EBMUD
Industry Specialists	<ul style="list-style-type: none">▪ Provide program advisement▪ Assess program and quality performance▪ Contribute to program modifications▪ Measurement and verifications
Food Service Technology Center	<ul style="list-style-type: none">▪ Develop ASTM standard for efficient spray valves▪ Provide technical assistance to EBMUD and water utilities, including training of field personnel

Marketing Outreach and Customer Enrollment

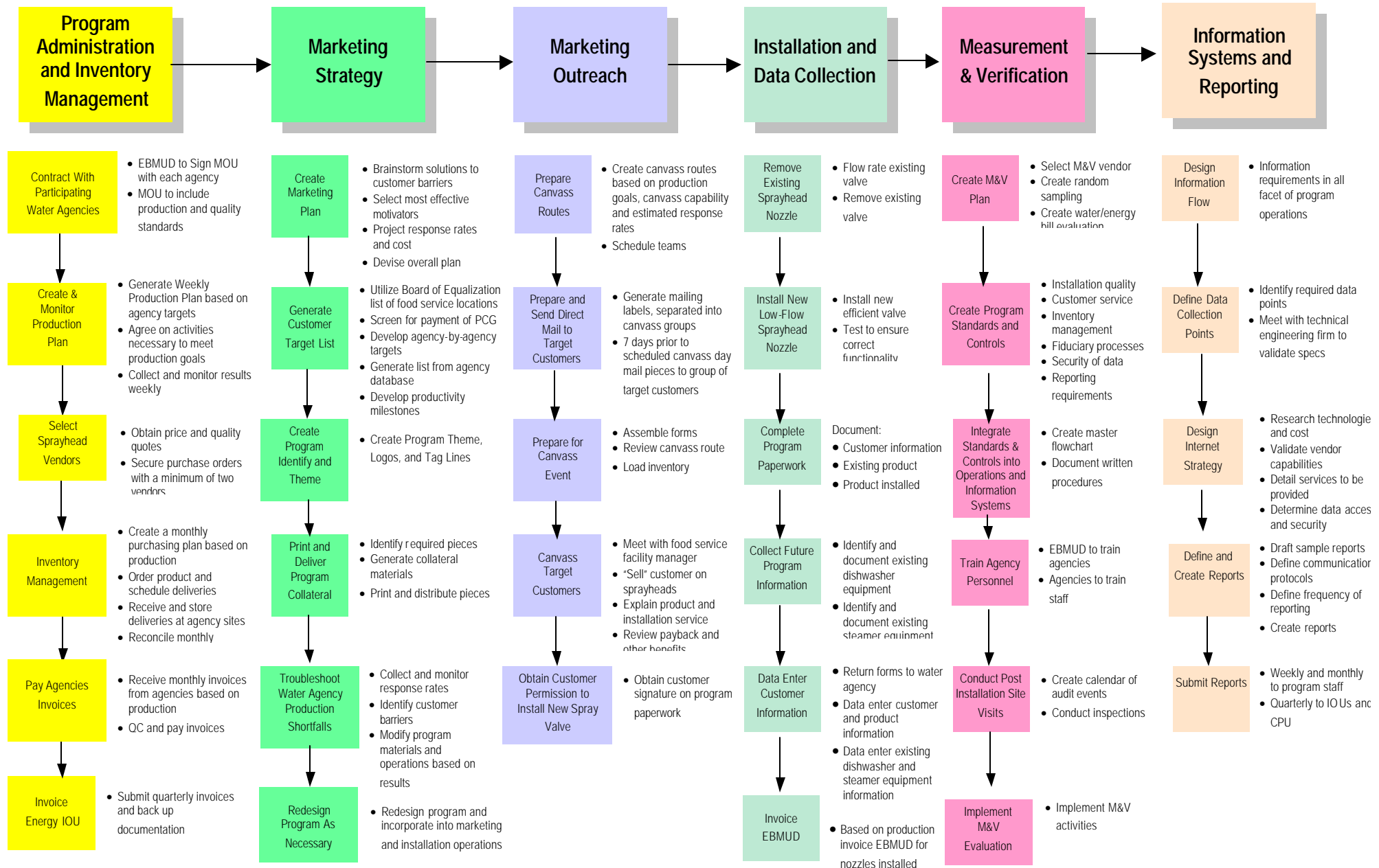
Although the program will be targeted toward the small to mid-sized operation, all customers in the food service industry will be eligible to participate.

The first contact with the customer will be through a direct mail piece produced in English, Spanish, and other languages specified by local utilities. The mailed piece will explain the product and installation offering and announce the upcoming door-to-door canvas. A local telephone number will be provided for customers to call for more information or to set up an appointment outside the canvas times.

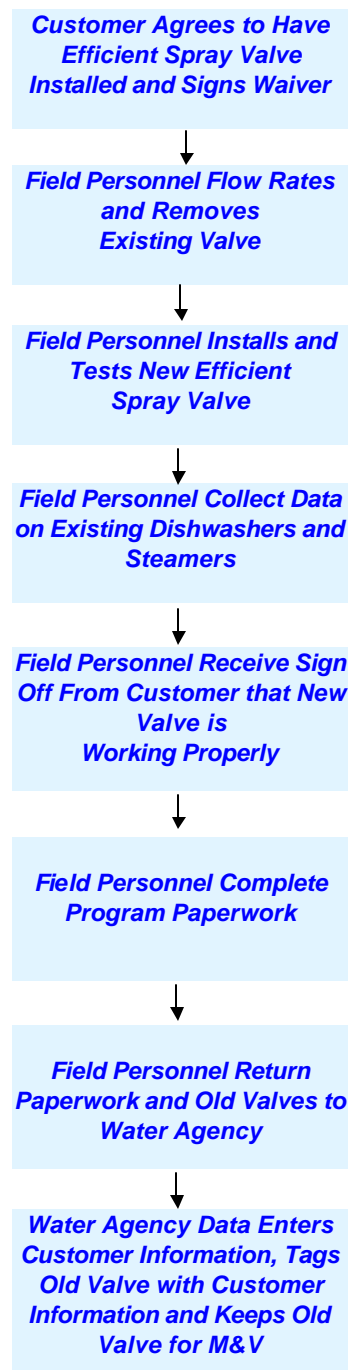
Approximately one week following the mailing, professional water utility representatives will go door-to-door through the business communities and offer immediate and free installation of the pre-rinse spray valves.

Canvassing will be performed with sensitivity to business workloads. Restaurants will be approached before or after their peak periods. If the food service owner/manager is unavailable, easy-to-read program information with the program phone number will be left with the supervisor. In similar canvas-style programs we have found that 7% of our participating customers respond to the program materials left on-site.

East Bay Municipal Utility District Pre-Rinse Spray Head and Dishwasher Installation Program



Equipment Purchasing Flow Chart



Equipment Purchasing

The Food Service Technology Center (FSTC) will develop specifications for the pre-rinse spray valve product to be purchased and installed under this Program. The maximum flow rate of the pre-rinse spray valve used in this Program will be less than 1.6 gpm as determined by the Standard Test Method, also developed by the FSTC. The cleaning performance of the valve will be equal to or better than the cleaning performance of a high-flow 2.65 – 4.0 gpm valve, also as determined by the FSTC's standard test method. The energy-efficient valve's performance will be documented in a published test report and the information will be available to the public. Only valves that meet the stringent criteria developed by the FSTC will be purchased for direct installation.

EBMUD will initiate a competitive bid process to select the highest quality products for the lowest possible costs. At a minimum, two vendors will be selected to ensure product availability at all times.

The spray valves will be ordered in bulk by EBMUD and drop-shipped to the local water utilities through a standard “upon demand” inventory management system. The “upon demand” system enables us to maintain a healthy cash flow and minimum inventory loss. The water utilities have extensive experience in inventory management, and EBMUD anticipates that there will be minimal inventory shrinkage and reconciliation issues. Monthly inventory reconciliations will be performed by each participating water utility and submitted to EBMUD. Any reporting discrepancies will be immediately addressed on-site by EBMUD. In the event of continued inventory problems, local operations will be suspended until the problem is corrected.

A list will be developed in cooperation with the FSTC for dishwashers eligible for the rebate program.

Equipment Installation

The replacement of an existing high-volume pre-rinse spray valve with an efficient unit is a simple task and involves less than 10 minutes of labor.

Water utility personnel or their subcontractors will receive written installation authorization from the customer at the time of the door-to-door canvassing. After the customer has signed the authorization, the installer will conduct a flow rate test of the existing fixture prior to its replacement. Following the flow test, the installer will remove the existing valve, clean the nozzle of residue, and install the new valve. The installer will “run” the new valve and check for leaks or manufacturer defects. If leaks or defects exist, the installer will install another valve.

All existing inefficient valves will be removed from the customer's premises and deposited in a central location for the subsequent measurement and verification process. A sampling of the old valves will be tested for existing flow rates in order to determine the water and energy savings resulting from removal and replacement with an efficient model.

The installer will educate the customer regarding the benefits of the new spray valve and the different “feel” of the unit. The customer will be shown that, although water volume is less, the spray velocity is much stronger and more effective than the old technology. The installer will demonstrate to the customer that the valve is working properly and receive sign-off from the customer. A follow-up telephone number will be left with the customer, should they have questions or product problems.

Customer Eligibility

EBMUD is targeting food service customers within each participating water utility's service area. The food service target population covers a broad range of business types and sizes and is diverse in its appeal to economic, ethnic, and ownership mixes:

Customer Size

Food service operations can be very small to large in size, ranging from a small restaurant with a less than 20kW demand and a 10,000 therm consumption to a major hospital kitchen and cafeteria. All operations with an inefficient pre-rinse spray valve installed will be eligible to receive a replacement valve.

Hard-to-Reach Segments

This Program will be targeted toward "hard-to-reach" segments of the food service industry. Neighborhood business customers, who do not generally participate in energy efficiency programs due to multiple barriers, are highly responsive to face-to-face dialogue with a friendly representative who takes the time to explain the program. Much of the energy- and water-efficiency vernacular is not easily translated into print, and programs with only mail outreach typically fail to address multi-cultural communities. Canvassing overcomes this barrier.

Geographic

The program will cover the geographic territory of participating water utilities as shown on the chart below titled *Estimated Participants by Geographic Area*.

Lease Barriers

Another attractive program feature is that both property owners and the food service tenant receive an economic benefit from its design. The owner most likely pays the water bill and will realize a post-retrofit reduction in billing units. The tenant typically pays the energy bill, and likewise will benefit from program participation.

Chain Accounts

Small and large chain accounts alike are expected to participate. Because a significant number of food service chain accounts are owned and operated by franchisees, they typically have the characteristics of a small to mid-sized customer. They are faced with the same barriers to participation and similar financial scenarios. Under this Program, we will be targeting franchised chain accounts as well as the traditional hard-to-reach food service operator.

There are approximately 75,000 food service facilities in California⁶, excluding the large institutional-type users. Within these 75,000 facilities, it is estimated that there are approximately 120,000 pre-rinse spray valves.

We believe there are another 40,000 large food service facilities such as hospitals, schools, senior centers, corporate cafeterias, etc. From this 40,000 we expect to achieve 1,600 (or 10% of the total) spray valve installations. Data on these large facilities was unavailable at the time of this proposal. Therefore, for the purposes of this proposal and the energy savings calculations, we have utilized numbers from the very small to mid-sized market only.

These calculations also assume that there is only one pre-rinse valve per facility used intensively for dish washing. The other pre-rinse spray valves are used in pot filling or rinsing applications that are less intense or less predictable than dish washing. (Further study will be required to assess the water/energy consumption of this population of valves.) Therefore, for the purposes of this calculation, we have adjusted the total California population of pre-rinse spray valves down to a conservative number of 75,000 eligible for retrofit.

Of the 75,000 available for retrofit in California, approximately 19,000 are within the service areas of participating water utilities. We anticipate replacing 9% (or 6,540) of these within two years as shown in the following table:

Estimated Participants by Geographic Area

Participating Water Utility	Geographic Service Territory	Estimated Total Population of Spray Valves	Estimated Program Replacement Goal (valves)
Santa Clara Valley Water District and the City of San Jose	All of Santa Clara County	4,147	1,369
San Francisco PUC	City and County of San Francisco, San Mateo County and the City of Hayward	5,645	1,863
East Bay Municipal Utility District	Portions of Alameda and Contra Costa Counties	2,663	1,258
San Diego County Water Authority	San Diego County	6,216	2,051
TOTAL PROGRAM	25% of California Food Service Facilities	18,671	6,541

Program Benefits and Costs

⁶ California State Board of Equalization, Taxable Sales in California, 2000 [Third Quarter and 2000 Fourth Quarter](#)

Water and Energy Conservation Potential

The program is intended to incorporate important new resource conservation technologies and practices with a potential to further conserve limited water and energy resources, and promote opportunities for partnerships between utilities, community and vendor groups. The program is expected to have quantifiable monetary benefits in improved water, wastewater, and energy efficiencies.

Enhance Public Awareness

This program is expected to have even more significant benefits in enhanced public education and technology transfer. Lessons learned within the food service industry, equipment service life, return on energy and water conservation investments, and review of regulatory issues will inform similar installation scenarios not only in other utility service areas, but potentially in other markets as well. Interagency exchange of information about water and energy use efficiencies of pre-rinses and commercial dishwashers and the establishment of technology standards can be used in these settings and could speed the implementation of additional programs.

Increased Regional Cooperation

Potential partnerships that would be enhanced by this program include regional and state-wide collaboration among retail and wholesale agencies, and increased cooperation and coordination on resource conservation programs between the water and energy utilities. This program would encourage interagency alliances between community groups, water suppliers, energy providers, commercial equipment vendors and environmental groups. The dissemination of information collected could be used to expand incentive programs and develop marketing strategies.

Cost-Effectiveness Calculations

Program Assumptions

Pre-Rinse nozzles

Daily savings: 360 gallons (1.5 gpm x 4 hr) AF Savings per device: 1.729 (6 days/wk for 5 years)

Avoided cost: \$430/AF

Value of Water Savings: \$743

Installation Cost of Product: \$185

Dishwashers

Incremental Costs: \$4,000

Water Saved: 1.4 AFY

AF Savings per device = 7

Avoided cost: \$430/AF

Value of Water Savings: \$3,010 (5 year life)

Rebate amount: up to \$3,000

Potential Energy and Water Savings – Pre-rinse spray nozzle

Non-residential category	Population of Pre-rinse Spray Valves*	Hours of valve usage per day	Water savings per valve (gal/day)	Gas savings per valve** (therms/day)	Total potential gas savings (therms/year)	Total potential water savings (ccf/year and acre-feet/yr)
Medium size	15,000	6	300	2.0	11,000,000	2,200,000 ccf
Small size	35,000	4	200	1.3	16,600,000	3,400,000 ccf
Very small size	25,000	2	100	0.7	6,400,000	1,200,000 ccf
TOTAL in California	75,000				34,000,000	6,800,000 ccf = 15,800 afy
TOTAL in Service Areas of Participating Water Utilities	18,671				8,400,000	2,812,630 ccf = 6,457 afy
TOTAL Participation Estimate	6,541				2,950,384	985,347 ccf = 2,262 afy

* Based on a NAFEM⁷ inventory of installed dishwashing machine populations and types.

** Assumes a water heating efficiency of 70% and a 55°F temperature rise.

Food service facilities in the “very small” category⁸ typically either have under-counter dish machines or no dish washing machines at all. The pre-rinse spray valves in these facilities are installed on pot washing sinks, where they are used for at least two hours each day.

⁷ *National Association of Food Equipment Manufacturers*

⁸ *Categories (sub-sectors) are defined by the CPUC in the Energy Efficiency Policy Manual*

The majority of food service facilities fall into the “small” category. These facilities utilize door-type dish machines with adjacent pre-rinse stations, which operate for least 4 hours per day. The “medium” sized facilities generally use conveyor or flight-type dish machines, and the pre-rinse stations in these facilities are at the top end of the pre-rinse usage range at 6 hours per day.

The cost effectiveness of the program has been evaluated and is presented in two forms, one for gas only and the other including the benefits associated with the water savings. The cost effectiveness test results for the Pre-rinse program are as follows:

Program Cost-Effectiveness Test Results

	<i>Gas Costs and Benefits</i>		<i>Combined Gas and Water Costs and Benefits</i>	
	<i>TRC Test</i>	<i>Participant Test</i>	<i>TRC Test</i>	<i>Participant Test</i>
Costs	\$1,294,165	\$ 0	\$1,294,165	\$ 0
Benefits	\$5,907,342	\$5,907,342	\$10,738,737	\$10,738,737
Ratio	4-6	Infinite	9.035890157	Infinite
Net Benefits	\$4,613,177	\$5,907,342	\$9,444,572	\$10,738,737

Water and energy savings data for pre-rinse spray valves, both inefficient and efficient types, in various applications was developed by the FSTC through field and laboratory testing. The FSTC is the source of the regional and local data, including number of food service operations by geographic area, together with application of market penetration and savings data.

Program Cost Proposal

Item	First Year Cost	Second Year Cost	Total Cost
Administrative Costs			
Labor	\$50,000	\$70,000	\$120,000
Benefits	\$ 19,000	\$ 26,000	\$45,000
Overhead	\$ 7,600	\$ 10,300	\$ 18,000
Travel costs	\$ 6,000	\$ 5,000	\$ 11,000
Reporting costs	\$ 1,200	\$ 1,800	\$ 3,000
General and Administrative costs	\$ 7,000	\$ 70,000	\$ 14,000
Subcontractor costs (include same line items)	\$ 20,000	\$ 14,000	\$ 34,000
Marketing/Advertising/Outreach Costs			
1) Brochures (25,000 @ \$1.00 each)	\$ 15,000	\$ 10,000	\$ 25,000
2) Training materials (for canvassers/installers)	\$ 4,000	\$ 1,000	\$ 5,000
3) Letters and mailing costs (50,000 @ \$1.25)	\$ 30,000	\$32,500	\$ 62,500
Direct Implementation Costs			
1) Pre-rinse spray valve installation labor costs (16,903 direct installs @ \$25 each)	\$63,500	\$100,000	\$163,500
2) Pre-rinse spray valve purchase cost (16,903 valves at \$50 each)	\$127,050	\$200,000	\$327,050
3) Canvassing visits (20,000 visits at \$15 each)	\$110,000	\$190,000	\$300,000
4) Implementation water utility contractor administrative fee (6,541 valves @ \$15 each)	\$ 25,000	\$73,115	\$98,115
Evaluation, Measurement and Verification Costs			
1) Field Inspections	\$ 2,000	\$ 10,000	\$ 12,000
2) M&V Analysis	\$ 2,000	\$ 8,000	\$ 10,000

3) Savings Analysis and Verification	\$ 8,000	\$ 8,000	\$ 16,000
4) Dishwasher rebates 25 rebates 1 st year 75 rebates 2 nd year	\$50,000	\$150,000	\$200,000
Totals			
Total Costs	\$547,250	\$926,915	\$1,464,165
Estimated Cost per Installed Pre-rinse Spray Valve			\$185.85
Total Contributed by Water Utilities			\$500,000
Total Requested			\$964,165

Program Performance Goals

The breakdown of our production goals is as follows:

- 6,541 spray valves installed over approximately 2 years
- 100 dishwashers
- 925 spray valves installed per quarter
- 1,160 sites canvassed per month
- 60 businesses visited per business day
- 31% response rate

The recap of our energy and water savings projections is as follows:

- 2.9 million therms saved annually
- 2,940 acre feet of water saved annually

Estimated Program-Related Energy and Water Savings by Geographic Area

Participating Water Utility	Geographic Service Territory	Program-Related Energy Savings (million therms/yr)	Program-Related Water Savings (acre-feet/year)
Santa Clara Valley Water District and the City of San Jose	All of Santa Clara County	0.599	502
San Francisco PUC	City and County of San Francisco, San Mateo County and the City of Hayward	0.815	683
East Bay Municipal Utility District	Portions of Alameda and Contra Costa Counties	0.550	463
San Diego County Water Authority	San Diego County	0.897	752
TOTAL PROGRAM	25% of All Food Service Facilities	2,861	2,400

Requests for payment will be submitted quarterly to the appropriate IOU(s). Billings will be based on a “per spray valve installed” basis.

EBMUD will submit detailed invoice back-up showing the site locations and spray heads installed for the quarter. The documentation will be sorted by each IOUs service territory and participating water utility.

Evaluation, Measurement and Verification Plans

General Approach

Evaluating and measuring program success will encompass:

- Developing reliable baseline estimates of "capturable" energy savings within the typical food service operation's pre-rinse area.
- Measuring the number of inefficient pre-rinse spray valves replaced with energy-efficient spray valves.
- Assigning the energy savings to those replacements in accordance with the type of food service operation.
- Aggregating and reporting the energy savings to the IOU service areas.
-

Baseline Study: Early Verification of Per-Unit Savings

Energy and water savings attributable to the replacement of pre-rinse spray valves for each category of food service operation are shown in Section 4. These water savings estimates are based upon laboratory and field measurements by the FSTC. They will be further verified in the field during the first quarter of program implementation. Such field verification will be performed by program personnel working in conjunction with FSTC personnel and will encompass field measurements at a minimum of eight (8) installations in each food service category. Field measurements will consist, at a minimum, of spray valve usage periods (times of day and peak periods), water temperatures, actual flow rates, types of items rinsed, and volume through-put⁹ at the pre-rinse station for both the "before" and "after" conditions. This baseline data will be used in assessing program success as noted above.

Using the data gathered during the first quarter, the Baseline Study will be completed and fully documented during the second quarter of the Program and reported to the Program Administrator in accordance with Program reporting requirements.

Field Measurement and Reporting of Installed Pre-Rinse Spray Valves

Because it is a direct-install program (i.e., does not rely upon the customer to complete the installation of the energy-efficient spray valve), the measurement and reporting of spray valve installations will be based on field reports from program personnel.

Third-Party Verification of Installed Pre-Rinse Spray Valves

Although direct-install field reports are normally deemed to be sufficient evidence of installation, an independent (third-party) installation verification process will be

⁹ Through-put of chinaware, glassware, and utensils, measured in standard 20-inch by 20-inch racks (or equivalent)

implemented on this program to validate the field reports. This process will involve the random selection from the universe of reported installations a sample of installations for field inspection. Samples will be stratified in accordance with the category of food service operation and the service area of the responsible water utility. Sample sizes will be based upon a 95% confidence level that the result will be within $\pm 2\%$ of the actual installation percentage. In the event that, during the first two quarters of the program, in excess of 99 percent of the reported installations are found to be installed, the independent verification process may be temporarily modified or suspended.

The independent verification process will begin field inspections of the randomly selected sites no sooner than 45 days and no later than 120 days following the date of reported spray valve installation¹⁰. Results of the independent verification process will be reported on a quarterly basis in accordance with Program reporting requirements.

Aggregate Energy and Peak Demand Savings Achieved

Using the Baseline Study data and the installed (and verified) pre-rinse spray valve data, the aggregate and peak demand energy savings will be computed and reported.

Cost Effectiveness

The ongoing cost effectiveness of the program will be re-evaluated on a quarterly basis, based upon:

- ☒ aggregate energy and peak demand savings;
- ☒ cost of program implementation;
- ☒ changes to the effective useful life of spray valves, if any;
- ☒ changes to dish room practices of the food service operators.

This information will be submitted to the CPUC in accordance with program requirements.

Program Feedback and Mid-Course Changes

We expect that as implementation proceeds and the food service operators provide feedback, fine-tuning of the marketing and installation process will be required. This includes a possible re-focusing of canvassing efforts into areas more likely to (1) be more

¹⁰ A minimum period of 45 days is proposed to assure that the food service operation has ample opportunity to use the energy-efficient Spray Valve and provide the inspector with customer feedback and assure that the operation has not subsequently removed the efficient unit and replaced it with another inefficient one. Note: although the spray valve installer will be required to remove the inefficient spray valve and replace it with an energy-efficient unit, a condition of the installation will be that the inefficient unit must be removed from the premises by the installer, thereby preventing its reinstallation.

receptive to a direct install initiative; and (2) yield higher energy savings per program dollar invested. In addition, as relationships with the food service industry and spray valve manufacturers solidify and mature, we also expect that their support and assistance will increase and become more evident.

Continuing Program Activity

The feasibility of continuing the program beyond December 2004 will be based largely on the energy and water savings achieved and the cost effectiveness of the program as proposed. Our rather modest "penetration" of the pre-rinse spray valve market (i.e., approximately 9% percent, or 6,541 replacements in a market totaling approximately 19,000 units) would indicate that much remains to be done. In the absence of a CEC regulation mandating that only energy-efficient spray valves and dishwashers could be sold or installed in California¹¹, it would appear that continuation of the program might be justified.

¹¹ *With the data gathered to date, combined with the baseline data and programmatic information to be developed on this Program, it is possible that the California Energy Commission can make a case for regulation of pre-rinse spray valves. Efforts in that regard, however, are not within the scope of this proposed Program.*

- Conducted environmental science and engineering field operations. Participated in all phases of the Materials Damage Study for the California Air Resources Board, including site installation and monitoring, sample preparation and processing, and report writing. A member of technical team conducting field services for the Rocketdyne Wastewater Sampling Program. Services included flow meter installation and calibration, channel design, field sampling, laboratory preparation and report writing.
- **Manager, Southern Pacific Region/Conservation Engineer** - Guaranteed Energy Savings, Inc. Responsible for field service activities in California, Arizona, New Mexico and Texas. Responsibilities included marketing, new project development, site surveys, and management support of energy conservation systems for contracts exceeding \$2 million. Performed computer system installation and complete electrical system support. Directed the work of the field electrical crews on energy savings programs; conducted contract negotiations.
- Richard will be supported in this program by the services of a program administrator and three Water Conservation Supervisors.

Timeline for Program Implementation

Assuming award, EBMUD team anticipates that the first spray valve installation will occur three months following the selection date. Activities in the first month will be centered around finalizing M&V plans and signing contracts with all participating and funding entities. Concurrently, EBMUD and other participating water utilities will be re-vamping their facilities to accommodate the Pre-rinse Spray Valve Program; establishing program software; and hiring additional staff, as needed.

In the fourth week of start-up the spray valve bid and specification will be created and sent to viable product vendors. A vendor will be selected and purchase order established during the fifth week.

In the weeks following, the water utilities will be trained in program procedures, policies, and inventory requirements. The utilities will, in turn, provide field training for program staff. Field work will begin immediately following training. Quarterly reports and invoices will be generated and delivered six months after selection. The chart on the next page further describes the implementation tasks and timeline.

Program Implementation Chart

	WEEKS								MONTHS	
Tasks	1	2	3	4	5	6	7	8	3	4
Selects Spray Valve Dishwasher Program	■									
Finalize Program Operations and M&V Plan		■								
Establish Program Office and 800 Line				■						
MOU Execution with Water Agencies				■	■	■	■			
Computer Software Creation and Testing				■	■	■	■	■	■	
Recruit & Hire Personnel				■	■					
Select and Procure Spray Valves				■	■	■				
Finalize Work Plan and Schedule						■				
Draft Policies and Procedures						■	■			
Finalize Marketing Plan and Materials						■				
Draft and Print Program Forms and Materials						■	■			
Staff and Water Agency Training								■		
Program Kick Off and Field Work Begins									■	
Weekly and Monthly Reporting									■	
Field Inspections Begin										■
Quarterly and Final Reporting	Quarterly reports will begin in month seven and continue through final reporting in early 2004									

Description of Implementer's Qualifications

This program was designed by a team of energy and water efficiency professionals with an in-depth knowledge of food service operations (restaurants, dining halls, institutional food service providers, etc.). Principal designers of, and participants in, the program are:

- Food Service Technology Center, San Ramon (FSTC)
- East Bay Municipal Utility District, Oakland (EBMUD)
- Santa Clara Valley Water District (SCVWD)
- San Diego County Water Authority
- City of San Jose
- San Francisco PUC

The team assembled for this program is highly experienced in the design and implementation of efficiency programs. The specialists who have planned and will implement this program have energy and water conservation program experience with the following:

- Rebate and voucher processing
- Direct-install programs
- Giveaway programs
- Trade ally projects
- Door-to-door residential and commercial programs
- Large and small utilities

Our experience includes cooperating the following energy utilities:

- PG&E
- SDG&E



**Pacific Gas and
Electric Company**

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February 9, 2001

Daniel L. Muir
Water Conservation Representative
East Bay Municipal Utility District
Central Warehouse
Contact: Dan Muir, MS 48
1200 21st St.
Oakland, CA 94607

Subject: Evaluation of Water-Efficient Commercial Dishwashers in High-Volume Food Service Operations

Dear Daniel:

As the operators of Pacific Gas and Electric Company's Food Service Technology Center (FSTC), please know that we support the objectives and scope of your proposed project to promote water-efficient dishwashers in commercial food service facilities. Since the energy consumption of commercial dishwashers is directly proportional to its water consumption, the goal of your project is consistent with the goal of the FSTC to promote energy-efficient food service equipment.

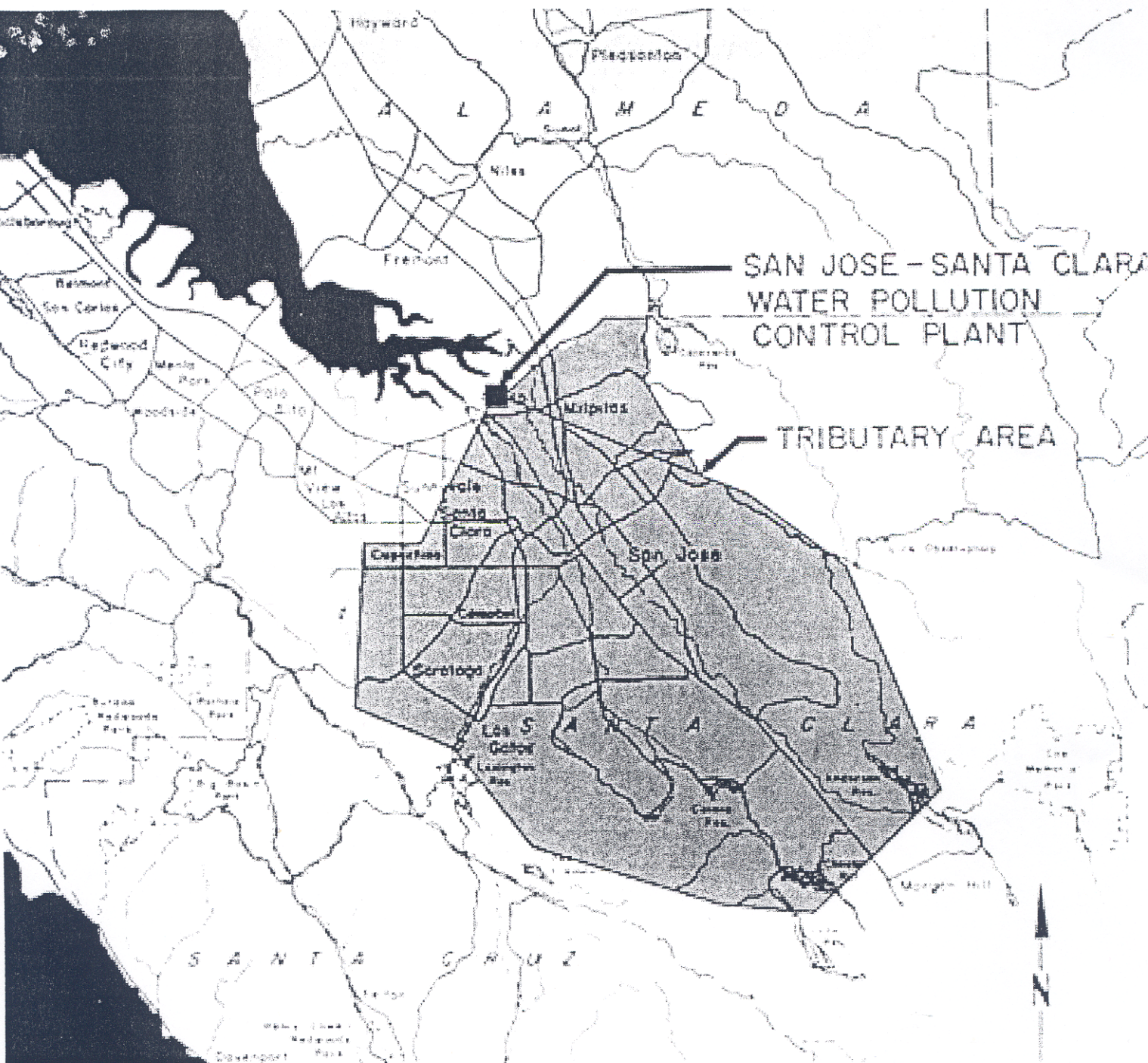
As your proposal implies, commercial dishwashing equipment is designed to quickly clean and sanitize ware at the expense of being water and energy intensive. Furthermore, the first cost and installation of commercial dishwashing systems is very high and energy efficient options are often neglected in an effort to reduce the initial capital investment. In addition to the cost of heating water (typically using natural gas), commercial dishmachines have a high demand for electricity to power pumps, tank heaters and, where applicable, booster heaters. The electric load reduction potential for California by promoting energy-efficient equipment is significant.

We anticipate that our research team would be able to provide technical support in the area of site selection, monitoring and data analysis. We would also be able to help identify restaurant sites and trade allies. It also is possible that our team could install energy monitoring equipment at selected sites. Laboratory testing of water-efficient and energy efficient candidate equipment could represent another support activity.

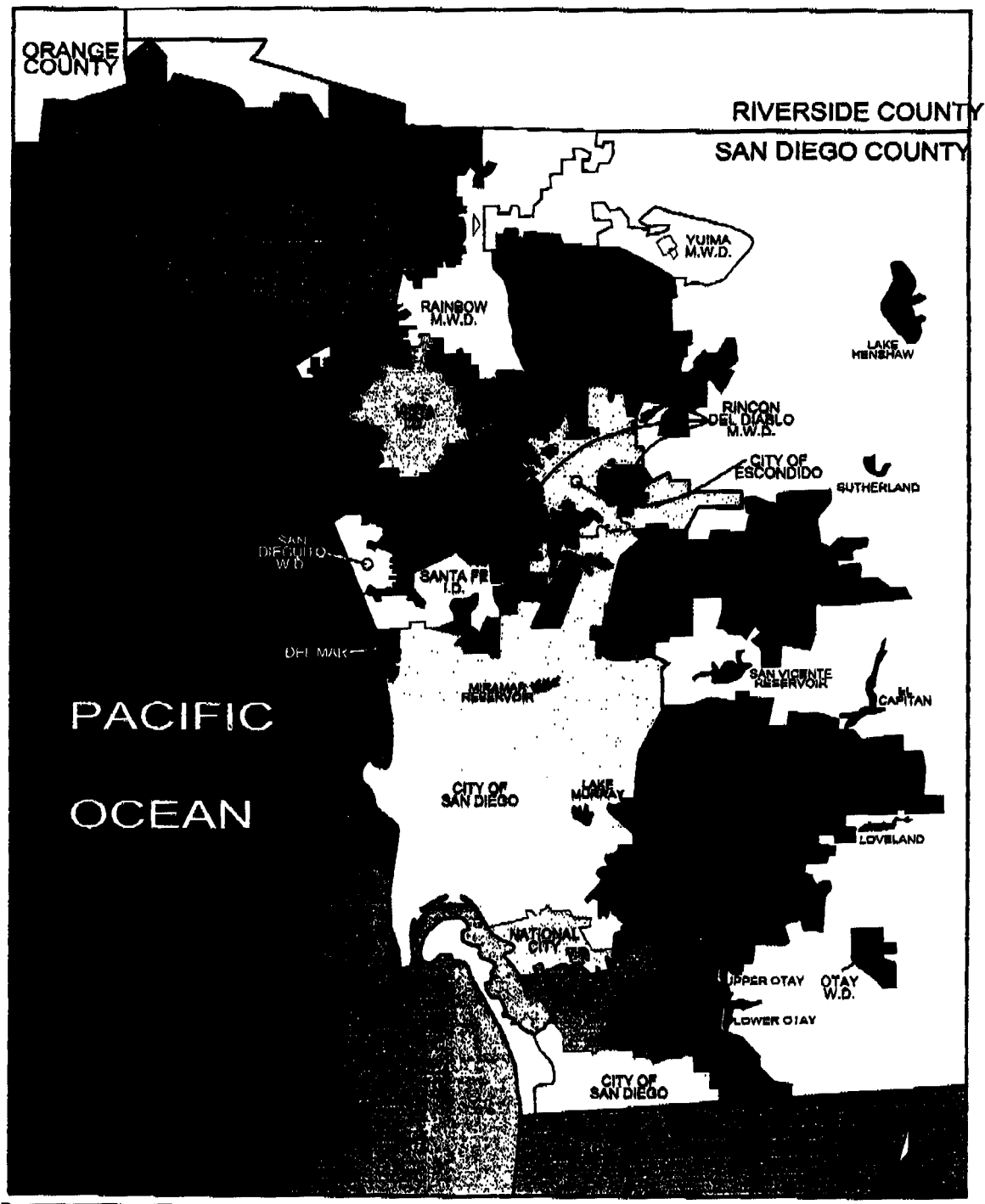
As your project moves forward, we would be pleased meet with your group to define the role and responsibilities of the Food Service Technology Center.

Yours truly,

Don Fisher
President, Fisher-Nickel, Inc.
Manager, Food Service Technology Center
www.pge.com/fstc



ATTACHMENT B-1
PROJECT AREA MAP



ATTACHMENT B-1 PROJECT AREA MAP

